AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE	PAGE OF PAGES
J	

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. *(If applicable)*
0001	02-Feb-2005	W25PHS-4342-4639	

6. ISSUED BY	CODE	7. ADMINISTERED BY *(If other than Item 6)*	CODE
U.S. ARMY ENGINEER DISTRICT, CONTRACTING DIVISION WANAMAKER BUILDING 100 PENN SQUARE EAST PHILADELPHIA, PA 19107-3390	W912BU	See Item 6	

8. NAME AND ADDRESS OF CONTRACTOR *(No., street, county, State and ZIP Code)*	(√)	9A. AMENDMENT OF SOLICITATION NO.
	X	W912BU-05-R-0009
		9B. DATED *(SEE ITEM 11)* 21-Jan-2005
		10A. MODIFICATION OF CONTRACTS/ORDER NO.
		10B. DATED *(SEE ITEM 13)*
CODE FACILITY CODE		

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☒ The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offers ☐ is extended, ☒ is not extended.

Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods:

(a) By completing Items 8 and 15, and returning _____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA *(If required)*

REPAIR OF BOAT SLIP BULKHEADS, POINT PLEASANT CANAL

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

(√)	A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: *(Specify authority)* THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.
	B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES *(such as changes in paying office, appropriation date, etc.)* SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(b).
	C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:
	D. OTHER *(Specify type of modification and authority)*

E. IMPORTANT: Contractor ☐ is not, ☐ is required to sign this document and return _____ copies to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION *(Organized by UCF section headings, including solicitation/contract subject matter where feasible.)*

THIS AMENDMENT DOES NOT EXTEND THE PROPOSAL DUE DATE OF MONDAY, FEBRUARY 7, 2005 AT 4:00 P.M.

(CONTINUED ON NEXT PAGE)

Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. NAME AND TITLE OF SIGNER *(Type or print)*		16A. NAME AND TITLE OF CONTRACTING OFFICER *(Type or print)*	
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA	16C. DATE SIGNED
(Signature of person authorized to sign)		BY *(Signature of Contracting Officer)*	

14. DESCRIPTION OF AMENDMENT (continued)

a. **TECHNICAL SPECIFICATIONS**:

NOTE: The following sections were amended. For simplicity, the complete section is being reissued when appropriate to enable complete substitution/insertion of the section in existing hard copies. To make detection of changes easier, only those pages with changes on them are annotated with "Amendment No. 0001" in the upper right corner. In addition, changes on a page are highlighted in ***bold italics when appropriate.***

(1) Section 01500 – TEMPORARY CONSTRUCTION: Please delete Section 01500 in its entirety and substitute the revised Section of the same number, annotated Amendment No. 0001, attached hereto.

(2) Section 01575 – STRUCTURES MONITORING: Please delete Section 01575 in its entirety and substitute the revised Section of the same number, annotated Amendment No. 0001, attached hereto.

(3) Section 02413 – SHEET PILING: Please delete Section 02413 in its entirety and substitute the revised Section of the same number, annotated Amendment No. 0001, attached hereto.

b. **CONTRACT DRAWINGS:** Please delete Drawing Sheet Nos. 62563 and 62569 in their entirety and substitute the revised drawings of the same numbers, with a revision date of 1 Feb 2005 attached hereto.

c. Please indicate receipt of this amendment on Standard Form 1442(SOLICITATION, OFFER, AND AWARD) as Amendment No. 0001. Failure to acknowledge all amendments may be cause for rejection of the bid.

SECTION 01500

TEMPORARY CONSTRUCTION

PART 1 GENERAL

1.1 SCOPE OF SECTION

The work covered by this section consists of furnishing all labor, materials, plant and equipment, and performing all operations required for the construction of storage areas, and service facilities needed for execution and completion of the work. Also included are the requirements for project and safety signs at the work site and a traffic control plan.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(Latest Rev.) Safety and Health Requirements Manual

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

NOTE: Any submittals classified as "SD-01 Preconstruction Submittals" require approval prior to mobilization to the contract work site. All other submittals, classified as "SD-02" through "SD-11," require approval prior to commencing the particular task to which the submittal is associated.

SD-01 Preconstruction Submittals

Temporary Facilities Plan; G,COR.

The Contractor shall submit to the Contracting Officer for approval, prior to the start of work, its plans showing the layout and details of all temporary facilities to be used for this contract, including the proposed locations of staging areas, proposed alignment of all safety fencing, including the location of gates.

1.4 SITE CONDITIONS

The conditions at the work site require that a lifesaving skiff be manned and immediately available when working over water. All safety equipment shall be in accordance with the requirements of EM 385-1-1.

PART 2 PRODUCTS

2.1 WEATHER INSTRUMENTS

2.1.1 Rain and Snow Gage

National Weather Service standard gage with stand and wind screen. The gage shall be designed to measure both rain and snow, shall be manufactured of copper and brass, and shall contain a funnel, inner tube, outer cylinder and dipstick.

2.1.2 Thermometer

Minimum/maximum outdoor type with instrument shelter. The thermometer shall be mercury filled and designed to indicate minimum, maximum, and current temperatures from -40 to 130 degrees F.

2.2 GOVERNMENT FIELD OFFICE

The Government field office trailer to be provided by the Contractor shall be new or recently renovated to a like-new condition subject to the approval of the Contracting Officer. The Government field office shall have a minimum floor area of ***200*** square feet, two locking doors, and partitioned restroom facilities. The trailer shall have sufficient lighting to supply 150 foot-candles at the desk top level and shall be supplied with 110 volt and 220 volt electrical outlets as required for heating, air conditioning, lighting, and other accessories.

2.2.1 Office Equipment

The following office equipment shall be provided by the Contractor for the Government field office trailer:

a. ***One*** desk having 60-inch by 30-inch tops, with lockable drawers; two swivel chairs; and ***one*** tables with 60-inch be 30-inch laminated tops;

b. Telephone, ***one*** set, ***one*** number, unlimited calling area, and one telephone answering machine;

c. ***One*** waste baskets;

d. Combination Copier/Phone/Fax Machine, Canon Faxphone L80, or approved equal, including adequate supplies and service agreement;

e. Two portable two-way [marine] radios with charges capable of operating on the Contractor's working frequencies;

f. Countertop microwave oven, with digital display, interior light, and a minimum 0.6 cubic feet capacity; and

PART 3 EXECUTION

3.1 CONTRACTOR'S PROJECT OFFICES

A Contractor's project office is not required for this contract. However, the Contractor shall, at all times during the contract period, be equipped and staffed to provide essential information to the Contracting Officer or its authorized representative. The Contractor shall be equipped with a mobile telephone, a copy of all drawings and specifications, and other pertinent information, and shall at all times give the Contracting Officer access thereto.

3.2 GOVERNMENT FIELD OFFICE

The Contractor shall provide and maintain a field office at the project site for the sole use of the Contracting Officer's representatives. The office shall be complete and ready for occupancy not later than 30 days after receipt of Notice to Proceed, and, one week before job site execution begins.

a. The Contractor shall provide the trailer at the work site with adequate heat, light, electricity, air conditioning, water, toilet and lavatory facilities. The Contractor shall provide portable water, provide for treatment of sewage, and provide permanent electric and telephone services, all in accordance with applicable local municipal, county and State codes. All utility costs arising from the use of the office, including telephone cost, shall be borne by the Contractor.

b. The trailer shall be placed on concrete block supports, leveled and tied down to withstand wind loads. A corrugated metal curtain shall be installed around the perimeter of the trailer from floor level to the ground. The curtain shall be firmly attached to withstand appropriate wind loads. All water piping and all waste piping shall be adequately supported and insulated.

c. The Contractor shall provide all janitorial supplies and services for the trailer complex to include as a minimum, weekly sweeping, dusting, emptying of waste baskets, trash collection, and servicing of toilets and monthly mopping of all floors, sterilization of toilet seats, waxing of all tile floors and washing of windows. The Contractor shall also provide for major maintenance to the trailer and its utilities.

d. The exterior area of the office shall be lighted during hours of darkness.

e. The Contractor shall provide the above described facilities, equipment, and services for the life of the contract.

3.3 WEATHER INSTRUMENTS

The Contractor shall provide and maintain at the work site in locations determined by the Contracting Officer, weather instruments consisting of a rain and snow gage with stand and a thermometer with instrument shelter. The Contractor shall take daily readings of precipitation and the minimum and maximum temperatures, and shall record such information on the Contractor Quality Control Reports as required under Section 01450 CONTRACTOR QUALITY CONTROL. This information will be used by the Contracting Officer as the basis for determining if the Contractor is

entitled to a time extension for unusually severe weather in accordance with Special Clause: "Time Extensions for Unusually Severe Weather."

3.4 DUST CONTROL

The amount of dust resulting from the contract work shall be controlled to prevent the spread of dust to occupied portions of the construction site and to avoid creation of a nuisance in the surrounding area.

3.5 PROTECTION

3.5.1 Protection of Existing Property

Before beginning any contract, the Contractor shall carefully survey the site and examine the drawings and specifications to determine the extent of the work. The Contractor shall take all necessary precautions to avoid damage to existing property to remain in place and any damaged items shall be repaired or replaced as approved by the Contracting Officer at no additional cost to the Government. The Contractor shall carefully coordinate the work of this section with all other work and shall construct and maintain shoring, bracing and supports, as required.

3.5.2 Environmental Protection

The work shall comply with the requirements of Section 01355 ENVIRONMENTAL PROTECTION.

3.6 RESTORATION OF WORK SITE

Removal of all temporary construction and restoration of the work site upon completion of the contract shall be in accordance with the requirements of Section 01355 ENVIRONMENTAL PROTECTION.

3.7 MEASUREMENT AND PAYMENT

No separate measurement or payment will be made for the work specified in this section and all costs in connection therewith shall be included in the cost of all the bid items.

-- End of Section --

SECTION 01575

STRUCTURES MONITORING

PART 1 GENERAL

1.1 SCOPE OF SECTION

The work specified in this section consists of furnishing all labor, materials and equipment, and performing all operations required to monitor structures for potential effects of the contract work.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

NOTE: Any submittals classified as "SD-01 Preconstruction Submittals" are submittals required to be submitted to, and approved by, the office indicated prior to mobilization to the contract work site. All other submittals, classified as "SD-02" through "SD-11," shall be submitted to, and approved or reviewed by, the office indicated prior to commencing the particular task to which the submittal is associated.

SD-01 Preconstruction Submittals

Qualifications; G,DO

The qualifications of the professional engineer, including a copy of their license, proposed to develop and conduct the structure monitoring shall be submitted.

Pre- and Post-Construction Surveys Plan; G,DO.

The Contractor shall submit, for approval, his proposed plan for conducting pre- and post-construction surveys. Included in this plan, but not limited to, shall be: the amount and locations of photographs and video; the type of information that will be noted; and, the method for measuring and recording the location, width and length of existing cracks in the structure.

Pre- and Post-Construction Survey Reports; G,DO.

The Contractor shall submit, for approval, pre- and post-construction survey reports. A separate compact disc (CD), including the report and associated photos ***and video*** shall be provided for each structure.

Structure Monitoring Plan; G,DO.

The Contractor shall submit, for approval, a structures monitoring plan describing the personnel, materials, equipment and methods to be utilized to monitor the effects of the contract operations on existing structures. In addition, the monitoring plan shall include qualifications of the personnel developing the monitoring plan; qualifications of personnel who shall do the monitoring;

frequency of monitoring during each phase of the construction; maximum acceptable vibration level; and contingency plan if that vibration level is approached.

Monitoring Report; G,DO.

The Contractor shall submit, for approval, monitoring reports. Reports of the monitoring shall be submitted the week following the monitoring on compact disks (CD), and include details of where and when the monitoring was performed, the frequency and peak particle velocities of the vibrations, the limiting criteria and any relevant notes.

1.3 OBJECTIVE

The Contractor shall monitor structures during this contract for vibration. The objective of this monitoring is to predict and prevent damage to the structures from the Contractor's work operations. Any damage to the structures as a result of the Contractor's work operations shall be the responsibility of the Contractor.

1.4 QUALIFICATIONS

A professional engineer with a minimum of 2 current monitoring projects similar in type and scope to this monitoring work, shall develop the proposed monitoring plan.

1.5 PHOTOGRAPHY

All photography shall be conducted as specified under paragraphs 1.3 QUALITY ASSURANCE and 1.4 GENERAL REQUIREMENTS of Section 01320 CONSTRUCTION PHOTOGRAPHY, except the video shall be digital.

PART 2 PRODUCTS

PART 3 EXECUTION

3.1 DESCRIPTION OF STRUCTURES

The structures to be monitored shall be the nearest house to the sheet pile driving operations. Structures include, but are not limited to, residential buildings, in-ground pools and attached decks. Sheds and detached garages shall not be included in the structures monitoring.

3.2 PRE-CONSTRUCTION SURVEY REPORT

The Contractor shall conduct a thorough pre-construction survey of the ***interior and*** exterior of all the structures within the monitoring limit, including the foundations of the structures. This survey shall include, but shall not be limited to, taking photographs and video of all exterior faces of the structures, recording the type of structures and their construction, recording overall ***interior and*** exterior conditions, recording specific ***interior and*** exterior distress areas (with closeup photos), including, but not limited to, measuring and recording the location, width, and length of existing ***interior and*** exterior cracks.

3.3 MONITORING

Monitoring shall include the daily use of a seismograph at the nearest

house where sheet pile driving is occurring. The seismographs shall be placed at locations on the structures or on the ground at the base of the structure to obtain the highest peak particle velocities. Representative structures shall be defined as one of each type of structure (i.e. residential, public, commercial, in-ground pools, etc.), and, for each structure type, one of each foundation type (pile foundation, masonry, concrete, slab on grade).

The maximum acceptable vibration level shall be determined from the chart attached at the end of this section, published by the United States Bureau of Mines Report of Investigation 8507, dated 1980.

3.4 EXCEEDING ACCEPTABLE VIBRATION LEVELS

The Contractor shall not continue any activity that results in peak particle velocities greater than the maximum acceptable vibration level. Should any construction activity impact a structure, the aforementioned engineer will reinspect the structure(s) and report the findings, including digital images, to the Contracting Officer via compact disk no later than one day following the reinspection.

3.5 POST-CONSTRUCTION SURVEY

The Contractor shall conduct a thorough post-construction survey of the exterior of all the monitored structures, including their foundations. This survey shall include, but shall not be limited to, taking photographs and video, recording overall condition, recording specific distress areas including, but not limited to, measuring and recording the location, width, and length of the cracks documented in the pre-construction survey, as well as, any new cracks.

3.6 DISPOSAL

All records of private property, including all photos and images, shall be turned over to the Government, at the end of the contract, to be destroyed.

3.7 MEASUREMENT AND PAYMENT

The work specified in this section will not be measured for payment and all costs in connection therewith shall be included in the contract lump sum price for Bid Item No. 7, "Structures Monitoring".

-- End of Section --

SECTION 02413

SHEET PILING

PART 1 GENERAL

1.1 SCOPE

The work covered by this section consists of furnishing all plant, equipment, labor and materials and performing all operations in connection with the installation of Contractor furnished composite and steel sheet piling in accordance with these specifications and applicable drawings.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3034	(2000) Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M	(2002) Structural Welding Code - Steel

AMERICAN WOOD-PRESERVERS' ASSOCIATION (AWPA)

AWPA C2	(2000) Lumber, Timber, Bridge Ties and Mine Ties - Preservative Treatment by Pressure Processes
AWPA P5	(2002) Standard for Waterborne Preservatives

ASME INTERNATIONAL (ASME)

ASME B18.22.1	(1965; R 1998) Plain Washers

ASTM INTERNATIONAL (ASTM)

ASTM D 2240	(2003) Rubber Property - Durometer Hardness
ASTM D 256	(2004) Determining the Izod Pendulum Impact Resistance of Plastics
ASTM D 522	(1993a; R 2001) Mandrel Bend Test of Attached Organic Coatings
ASTM D 570	(1998) Water Absorption of Plastics
ASTM D 638	(2002a) Tensile Properties of Plastics

ASTM D 790	(2003) Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
ASTM A 36	(1992) Structural Steel
ASTM A 572/A 572M	(2003a) High-Strength Low-Alloy Columbium-Vanadium Structural Steel
ASTM C 564	(2003) Rubber Gaskets for Cast Iron Soil Pipe and Fittings
ASTM D 1784	(2003) Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM D 412	(1998a; R 2002e1) Vulcanized Rubber and Thermoplastic Elastomers - Tension
ASTM D 6110	(2004e) Charpy Impact Resistance of Notched Specimens of Plastics
ASTM F 593	(2002) Stainless Steel Bolts, Hex Cap Screws, and Studs
ASTM F 594	(2002) Stainless Steel Nuts
ASTM F 679	(2003) Poly(Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings
ASTM F 794	(2003) Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter
ASTM F 949	(2003) Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings

SOUTHERN PINE INSPECTION BUREAU (SPIB)

SPIB-01	(1994; Supplements 8 thru 11) Grading Rules for Southern Pine Lumber

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC Paint 16	(1982; R 2000) Coal Tar Epoxy-Polyamide Black (or Dark Red) Paint

1.3 QUANTITIES

The estimated quantities of sheet piling listed in the bid schedule of the contract to be furnished by the Contractor are given for bidding purposes only. Sheet piling quantities for payment shall consist of the linear footage of piling acceptably installed.

1.4 Quality Assurance

Requirements for material tests, workmanship and other measures for quality

assurance shall be as specified herein.

1.4.1 Materials Tests

Sheet piling materials shall be tested and certified by the manufacturer to meet the specified chemical, mechanical and section property requirements prior to delivery to the site.

1.5 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Equipment Descriptions; G, DO

The Contractor shall submit for approval by the Contracting Officer, prior to commencement of work, a written statement addressing the appropriate installation equipment / tools / mandrel and driving method as dictated by the soil classification. The Contractor (or Sub-Contractor) shall have had prior experience with driving composite sheeting and shall provide a list of previous job/s that demonstrate a satisfactory installation method. In addition, the Contractor shall coordinate with the vinyl manufacturer their recommendations concerning the proper equipment / tools / mandrel to be used.

SD-02 Shop Drawings

Shop Drawings; G, DO

Shop drawings for sheet piling shall be submitted for approval and shall show complete piling dimensions and details, driving sequence and location of installed piling. Shop drawings shall include details and dimensions of templates and other temporary guide structures for installing piling, and shall provide details of the method of handling piling to prevent permanent deflection, distortion or damage to piling interlocks.

SD-04 Samples

Sheet Pile Sample; G, DO

The Contractor shall provide a sample of each type of sheet pile and submit to the Contracting Officer for approval, prior to the installation.

SD-07 Certificates

Certificate of Compliance; G, DO

The Contractor shall submit a certificate with a notarized signature from a principal of the supplier that the sheetpile section proposed by the Contractor is capable of being driven the required embedment depth through the material shown in the boring.

Materials Test Certificates; G, DO

Materials test certificates shall be submitted for each shipment and identified with specific lots prior to installing piling.

Welder Qualifications; GA.

Certified copies of welder qualifications test records showing qualification in accordance with AWS D1.1/D1.1M.

SD-09 Field Reports

Driving Records; G, DO

Records of the sheet piling driving operations shall be submitted after driving is completed. These records shall provide a system of identification which shows the disposition of approved piling in the work, driving equipment performance data, piling penetration rate data, piling dimensions and top and bottom elevations of installed piling.

1.6 Quality Assurance

1.6.1 General

The Contractor shall establish and maintain quality control for pile driving operations to assure compliance with contract specifications and maintain records of his quality control for all construction operations including, but not limited to, the following:

(1) Accurate location, alignment and plumbness of piling.

(2) Full and proper engagement of interlocks.

(3) Driving (pile hammer and rate of operation).

(4) Final position; depth of penetration; tip and cut- off elevations.

(5) Uplift and vertical tolerances after driving.

(6) Location and elevation of any obstruction encountered and action directed by Contracting Officer.

(7) Pulled piles and redriving.

(8) Sand backfill of template voids

(9) Stockpiling and storage.

(10) Removal and disposal of damaged piles.

1.6.2 Reporting

The original and two copies of these records and tests, as well as the records of corrective action taken, shall be furnished the Government daily. Format of the report shall be as prescribed in Section 01450, "CONTRACTOR QUALITY CONTROL".

1.7 Delivery, Storage and Handling

Materials delivered to the site shall be new and undamaged and shall be accompanied by certified test reports. Sheet piling shall be stored and handled in the manner recommended by the manufacturer to prevent permanent deflection, distortion or damage to the interlocks. Storage of sheet piling should also facilitate required inspection activities.

PART 2 PRODUCTS

2.1 COMPOSITE SHEET PILING

Composite sheet piling shall be Endurance Composite Sheet Piling as manufactured by Northstar Vinyl Products, LLC, 225 TownPark Dr., Suite 300, Kennesaw, GA 30144-5509, 800-558-6702, http://www.endurancecsp.com, or approved equal, and shall have the following properties.

2.1.1 General

Sheet piling shall consist of an interlocking sections that ensure adjacent panels maintain alignment. The sheeting material shall be an engineered composite material pultruded from a resin and glass reinforcement fiber matrix having the following properties. The sheet pile shall be free from visible cracks and other injurious defects. All sheet pile shall be provided in full lengths.

2.1.2 Resin System

The resin system shall be a high performance resin exhibiting low water absorption, high UV resistance, high heat distortion temperature, high elongation, and high impact strength. Resin system's chemistry backbone shall be polyurethane. Polyester based resin systems are not acceptable.

2.1.3 Physical Properties

Minimum average physical properties(unless otherwise note) of the finished sheet pile material shall be:

Characteristic	Units	Standard
Charpy Impact (MD)	65 ft-lbs/inch	ASTM D 6110*
Izod Impact (XMD)	15 ft-lbs/inch	ASTM D 256*
Peak Tensile Stress (MD)	60 ksi	ASTM D 638*
Peak Tensile Stress (XMD)	11 ksi	ASTM D 638*
Peak Flexural Stress (MD)	74 ksi	ASTM D 790
Peak Flexural Stress (XMD)	26 ksi	ASTM D 790
Modulus of Elasticity (MD)	4,100,000 psi	ASTM D 638
Modulus of Elasticity (XMD)	1,100,000 psi	ASTM D 638
24 Hour Water Absorption	<0.35 %	ASTM D 570

MD = Machine Direction
XMD = Cross Machine Direction

*Properties shall be verified by an ISO certified laboratory on every 42,000 lbs of finished sheetpile material.

2.1.4 Geometric properties

The minimum average geometric properties of the finished sheet pile

material shall be:

Characteristic	Units
Moment of Inertia	51.5 in4/ft
Section Modulus	12.8 in3/ft
Weight	4 lbs/ft2

2.2 METAL SHEET PILING

Sheet piling shall be hot-rolled steel sections conforming to ASTM A 572/A 572M, Grade 50. The interlocks of sheet piling shall be free-sliding, provide a swing angle suitable for the intended installation but not less than 5 degrees when interlocked, and maintain continuous interlocking when installed. Sheet piling including special fabricated sections shall be full-length sections of the dimensions shown on the drawings. No splicing is permitted. Fabricated sections shall conform to the requirements herein and the piling manufacturer's recommendations for fabricated sections. Sheet piling shall be provided with standard pulling holes. Sheet piling shall have a factory-applied coal tar epoxy coating. Epoxy coating shall meet or exceed all requirements of SSPC Paint 16. Metalwork fabrication for sheet piling shall be as specified herein.

a. Cold-formed sheet piling

Cold-formed steel sections conforming to ASTM A 572/A 572M, Grade 50 may be substituted for hot-rolled steel sections provided that they have the same shape, thickness and dimensions as a hot-rolled PZ-27 section. The section modulus of the cold-formed steel section must be at least equal to the section modulus of the hot-rolled section.

2.2.1 Appurtenant Metal Materials

Metal plates, shapes, bolts, nuts, rivets and other appurtenant fabrication and installation materials shall conform to manufacturer's standards and to the requirements specified in the respective sheet piling standards. Fabricated corner sections shall be constructed as indicated on the drawings.

2.3 WALES

Wales for support of sheet piling shall be southern yellow pine timber conforming to SPIB-01, treated in accordance with AWPA C2 with waterborne preservatives listed in AWPA P5 to a retention level of 2.5 pcf intended for ground contact, and shall be factory or distributor coated with a polyurethane coating.

2.3.1 Polyurethane Coating

Epoxy coating shall be Silicon Based 21 Poly as manufactured by Northstar Vinyl Products, LLC, 225 TownPark Dr., Suite 300, Kennesaw, GA 30144-5509, 800-558-6702, http://www.endurancecsp.com, or approved equal, and shall have the following properties.

2.3.1.1 General

Polyurethane coating shall be a two component 100 percent solid polyurea with an extremely fast cure time and excellent adhesions to different substrates.

2.3.1.2 Physical Properties

Characteristic	Units	Standard
Tensile Strength (psi)	2250	ASTM D 412
Elongation (%)	750	ASTM D 412
100 percent Modulus	1300	ASTM D 412
300 percent Modulus	1490	ASTM D 412
Tear Strength (PLI)	410	ASTM D 2240
Hardness (Shore A)	85	ASTM D 522

2.4 CHANNEL CAP

The top cap for support of the sheet piling shall be fabricated of the same material specified for the sheet piling. Steel channel cap shall have the same coating as specified for the sheet piling.

2.5 MISCELLANEOUS HARDWARE

2.5.1 Bent Plates

Bent plates shall be carbon grade steel conforming to ASTM A 36.

2.5.2 Nut and Bolts

ASTM F 593 or ASTM F 594, Group 2 (316 alloy) stainless steel for nuts and bolts. ASME B18.22.1 for washers, except fabricate washers of 316 alloy stainless steel.

2.6 EPOXY COATING

The coating shall be a self-curing two component epoxy coating. Epoxy coating shall meet or exceed all requirements of SSPC Paint 16.

2.7 WEEP HOLE DRAINS AND DRAIN EXTENSIONS

The pipe manufacturer's resin certification, indicating the cell classification of PVC used to manufacture the pipe, shall be submitted prior to installation of the pipe.

2.7.1 Type PSM PVC Pipe

ASTM D 3034, Type PSM, maximum SDR 35, produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.7.2 Profile PVC Pipe

ASTM F 794, Series 46, produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.7.3 Smooth Wall PVC Pipe

ASTM F 679 produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.7.4 Corrugated PVC Pipe

ASTM F 949 produced from PVC certified by the compounder as meeting the requirements of ASTM D 1784, minimum cell class 12454-B.

2.8 UNIVERSAL COUPLINGS

Flexible pipe coupling shall be a sleeve-type, made of elastomeric polyvinyl chloride (PVC) and designed to fit the outside diameters of the existing ductile iron pipe and the new ductile iron pipe. Coupling shall meet the applicable requirements of ASTM C 564 and shall be furnished with stainless steel clamps as shown on the drawings for compression of the coupling to the pipes.

PART 3 EXECUTION

3.1 FACTORY-APPLIED COAL TAR EPOXY COATING

3.1.1 Surface Preparation

(a) All surface shall be thoroughly prepared for coating application in strict accordance with the coating manufacturer's recommendation. All cleaning and coating work must be performed in a heated building. Preceding grit blasting, steel must be heated to at least 100 degrees F to eliminate possibility of moisture on the surfaces to be cleaned and coated.

(b) Grit blasting shall provide a near-white surface preparation in accordance with SSPC SP-10, with a 3-4 mil profile. Surfaces that have been blasted as specified shall be coated on the same day as the cleaning operations have been completed.

(c) Any areas of the surface which show traces of oil, grease or other organic matter shall be removed prior to coating. The contamination shall be removed by using a solvent wash as defined by SSPC SP-1.

(d) All surfaces to be coated must be completely dry, free of moisture, soil, dust, grit, at the time the coating is applied.

(e) The finished coating shall be post-cured under cover at a temperature of approximately 110 degrees F wherever the ambient average temperature falls below 70 degrees F.

3.1.2 Application of Coating

The coating shall be applied to all surfaces of steel sheet piling to be located above elevation -12.0, with the exception of the interior contacting surfaces of the sheet piling interlocks. All sheets shall be coated individually (i.e., no double sheets). All coatings shall be applied by brush or spray, using commercially available spray equipment. The coating shall exhibit reasonable leveling without excessive sagging when applied at the required film thickness. Coating manufacturer's recommendations shall be adhered to strictly. The temperature of the coating shall not be less than the temperature of the steel at the time of application. The temperature of the substrate must be at least 5 degrees F above the dew point temperature.

3.1.3 Progress of Coating Work

Where coating on any type of surface has commenced, the complete coating operation, including priming and finishing coats when multiple coats are used on that portion of the work, shall be completed as soon as practicable, without prolonged delays. Where necessary, sufficient time shall elapse between successive coats to permit them to dry properly for recoating and this period shall be modified as necessary to suit shop conditions. Faster between coat applications are possible at higher temperatures; for example, if the initial coat is applied at 100 degrees F by use of an in-live heater, a second coat may usually be applied within three hours after the first coat.

3.1.4 Coating Thickness

A minimum thickness (not average) of 24 mils dry film is required on all surfaces to be coated. Where two coats are required to achieve the recommended film build, the interval between the coats should be no more than 24 hours. To insure maximum intercoat adhesion, it is recommended that:

(1) The next coat be applied as soon as possible after the previous coat is firm.

(2) If previous coat has cured for more than recoat time specified by manufacturer, brush sandblast, followed by dry cleaning such as vacuuming, use of air hose or sweeping to remove dirt. All surfaces to be recoated must show a surface profile sufficient to provide an adequate mechanical bond. Surface profile is essential for intercoat adhesion.

3.1.5 Final Curing Time

Coating surfaces shall be permitted as long a drying time as practicable but in any event the following minimum requirements shall be met. The steel coated with the coal tar epoxy system shall not be driven until the finished coating has cured at least 7 days at 77 degrees F, or been post-cured at higher temperatures for a short period of time in accordance with the coating manufacturer's recommendations.

Post-curing Temperature Recommendations:

12 Hours at 120 degrees F
18 Hours at 110 degrees F
30 Hours at 100 degrees F
96 Hours at 90 degrees F
168 Hours at 77 degrees F

3.1.6 Thinning

Thin the coating for application in accordance with the manufacturer's recommendations.

3.1.7 Inspection

(a) Satisfactory performance will be based on acceptance of the completed work by the Contracting Officer. All work will be subject to the inspection by the Contracting Officer. The grit blasting is to be approved before the start of the coating application.

(b) Inspection of the completed coating will be based upon a Nordson Mikrotest or other magnetic detector readings. Detection of inadequately coated sections will be indicated by circling with chalk the areas to be recoated.

3.1.8 Appearance of Finished Coating

(a) The finished coating shall be generally smooth and free of sharp protuberances which could be removed by abrasion. A minor amount of sags, dimpling or curtaining which does not exceed 2 to 3% of the surface will not be considered cause for rejection unless they present sharp edges which might be removed by abrasion.

(b) Sharp protuberances shall be cut off using a sharp wood chisel laid flat against the surface. The areas from which material has been removed shall be recoated to smooth the surface. Recoated areas shall meet the thickness requirements specified in the paragraph entitled: "Coating Thickness."

3.1.9 Protection of Coated Steel and Coating Repairs

The Contractor shall exercise extreme care in the handling of all coarse steel so as not to damage the coated surface. Any damage to the coating due to handling or construction operations shall be repaired by the Contractor at no additional expense. Exposed surfaces with damaged coatings from abrasion, drilling, bolting, welding, etc. shall be repaired using a similar coating. Wire brush clean as required all areas of welding to properly prepare surface for repair coating. Follow painting manufacturer's instructions and recommendations for surface preparation. All repair coating materials must be compatible with the original coatings and thicknesses and shall be submitted for approval prior to their usage. Repair coating shall match original coating thickness and shall be installed in accordance with all written manufacturer's instructions.

3.2 INSTALLATION OF SHEETPILE

3.2.1 Pile Driving Equipment

3.2.1.1 Driving Hammers

Pile driving hammers shall be of the vibratory type for composite sheet pile and of the impact or vibratory type for steel sheet pile.

3.2.1.2 Impact Hammers

Impact hammers shall be steam, air, or diesel hammers of the single acting, double-acting, or differential acting type. The rated energy of hammers shall be limited to a minimum of 8,750 foot pounds and a maximum of 16,000 foot pounds. The size or capacity of hammers shall be as recommended by the manufacturer for the pile weight and soil formation to be penetrated. Hammers shall be capable of, and so demonstrated during the development of refusal criteria, hard driving in excess of 20 blows per inch. Boiler, compressor, or engine capacity shall be sufficient to operate hammers continuously at the full rated speed. Hammers shall have a gage to monitor hammer bounce chamber pressure for diesel hammers or pressure at the hammer for air and steam hammers. This gage shall be operational during the driving of piles and shall be mounted in an accessible location for monitoring by the Contractor and Contracting Officer. Two spare operational bounce chamber read out units shall be available on site. The

Contractor shall provide bounce chamber pressure gage correction tables and charts for the type and length of hose to be used with the pressure gage to the Contracting Officer.

3.2.2 Placing and Driving

3.2.2.1 Placing

Pilings shall be carefully located as shown on the drawings. Pilings shall be placed as true to line as possible. Suitable temporary wales, templates, or guide structures shall be provided to insure that the piles are placed and driven to the correct alignment. Pilings properly placed and driven shall be interlocked throughout their length with adjacent pilings to form a continuous diaphragm throughout the length or run of piling wall.

3.2.2.2 Driving

The Contractor is advised that buried stumps, roots and similar debris may be encountered periodically on the sheet pile wall alignment and that the Contractor shall determine and use the proper size/model of equipment to counteract difficult driving and above obstructions. Prior to driving pilings in water a horizontal line shall be painted on both sides of each piling at a fixed distance from the bottom so that it shall be visible above the water line after installation. This line shall indicate the profile of the bottom elevation of installed pilings and potential problem areas can be identified by abrupt changes in its elevation. All piles shall be driven to the depths shown on the drawings and shall extend to the top of wall elevation indicated. The driving hammer shall be maintained in proper alignment during driving operations. Caution shall be taken in the sustained use of vibratory hammers when a hard driving condition is encountered to avoid interlock-melt or damages. The use of vibratory hammers should be discontinued and impact hammers employed when the penetration rate due to vibratory loading is one foot or less per minute. A protecting cap shall be employed in driving when using impact hammers to prevent damage to the tops of pilings. Pilings damaged during driving or driven out of interlock shall be removed and replaced at the Contractor's expense. All piles shall be driven without the aid of a water jet, unless otherwise authorized by the Contracting Officer. Water may be introduced to induce lubrication and liquifaction during installation. Adequate precautions shall be taken to insure that piles are driven/installed vertically and horizontally plumb.

(Text Deleted)

On each day of sheetpile driving, the Contractor shall stab only the number of piles that can be driven to grade by the end of the day, and all piling stabbed shall be driven to grade by the end of each working day except that the last two piles may remain tapered up to receive the next days piles. If the piling next to the one being driven tends to follow below final grade, it shall be pinned or bolted to the next adjacent piling. No pile shall be driven to a lower elevation than those behind it in the same run except when the piles behind it cannot be driven deeper due to an obstruction that is encountered. In case of an obstruction, piling/s will be allowed to remain above final grade until the obstruction is identified by the Contracting Officer and a remedy is provided to the Contractor. If it is determined by the Contracting Officer that an obstruction restricts driving operations and that the obstruction cannot be removed, the Contractor will be directed by the Contracting Officer to either cut the piling/s to design

grade or provide the Contractor an alignment change that by-passes the obstruction. Payment for the additional labor and materials necessitated by such changes will be made at the applicable contract prices.

a. Plumbness Tolerance: Sheet piling shall not be driven more than 1/2-inch per foot out of plumb in the plane of the wall nor more than 1/16-inch per foot "out" of plumb perpendicular to the plane of the wall, nor more than 1-inch per foot "in" of plumb perpendicular to the plane of the wall.

If at any time the forward or leading edge of the piling wall is found to be out-of- plumb more than specified tolerances the assembled piling shall be driven to the required depth and tapered pilings shall be provided and driven to interlock with the out-of- plumb leading edge or other approved corrective measures shall be taken to insure the plumbness of succeeding pilings. The maximum permissible taper for any tapered piling shall be 1-1/4 inch per foot of length. Unless specifically indicated otherwise, each run of piling wall shall be driven to grade progressively from the start and pilings in each run shall be driven alternately in increments of depth to the required depth or elevation.

b. Setting Width Tolerance: The setting width for every two adjacent piles shall be as shown on the drawings. The tolerance for the setting width shall be plus or minus 1/2-inch.

3.2.3 Pile Penetration Criteria

The controlling refusal blow count (number of blows required to attain the final inch of penetration) for the permanent piles will be 10 blows per inch for impact hammers or as determined by the Contracting Officer. Driving with a vibratory hammer shall be terminated when the rate of penetration is less than 1 foot per minute or as determined by the Contracting Officer. When refusal blow count occurs before required depth of pile is reached, the Contractor shall proceed as directed by the Contracting Officer.

3.2.4 Cutting-Off

Pilings driven to refusal or to the point where additional penetration cannot be attained and are extending above the required top elevation in excess of the specified tolerance shall be cut off to the required elevation. Pilings driven below the required top elevation and pilings damaged by driving and cut off to permit further driving shall be brought backup up to the required elevation by a method approved by the Contracting Officer, at no additional cost to the Government. The tops of pilings excessively battered during driving shall be trimmed when directed at no cost to the Government. Piling cut-offs shall become the property of the Contractor and shall be removed from the site. The Contractor shall cut holes in pilings for bolts, rods, drains or utilities as shown or as directed. All cutting shall be done in a neat and workmanlike manner. A straight edge shall be used in cuts made by burning to avoid abrupt nicks. Bolt holes in steel piling shall be drilled or may be burned and reamed by approved methods which will not damage the surrounding metal. Holes other than bolt holes shall be reasonably smooth and the proper size for rods and other items to be inserted.

3.2.5 Emergency Locking System on Pile Driving Head

All pile driving equipment shall be equipped so as to prevent piles from falling when a single or multiple power failure occurs after the pile driving head is attached to the pile.

3.2.6 Inspection of Driven Piling

The Contractor shall inspect the interlocked joints of driven pilings extending above ground. Pilings found to be damaged during driving or driven out of interlock shall be removed and replaced.

3.2.7 Pulling and Redriving

The Contractor may be required to pull selected piles after driving, for test and inspection, to determine the condition of the piles. Any pile so pulled and found to be damaged to the extent that its usefulness in the structure is impaired shall be removed from the work and the Contractor shall furnish and drive a new pile to replace the damaged pile. Piles pulled and found to be in satisfactory condition shall be redriven.

3.2.8 Composite Channel Cap

Channel cap shall be installed as shown on the drawings. Channel cap shall have mitered corners where a change of direction occurs.

3.3 WALES

Timber wales shall be installed as shown on the drawing using stainless steel nuts and bolts. Splices between sections shall be as shown.

3.4 INSTALLATION OF MISCELLANEOUS HARDWARE

Bent plates shall be welded to the existing steel sheetpile as shown on the drawings. Existing steel sheetpile shall be power grinded prior to welding. Welding shall be in accordance with AWS D1.1/D1.1M. Field welded structural connections shall be completed before load is applied.

3.4.1 Epoxy Coating

After erection, field welds shall be cleaned, surface prepared and the bent plates and welds painted with coal tar epoxy paint. All exposed steel items that are accessible after erection shall be solvent cleaned to remove all grease, oil, dirt, etc. prior to painting with coal tar epoxy paint. All coal tar epoxy paint shall applied in accordance with the paint manufacturer's written instructions and recommendations.

3.5 INSTALLATION OF WEEP HOLE DRAINS AND DRAIN EXTENSIONS

3.5.1 Weep Hole Drains

Weep hole drains shall be installed in composite and steel sheet pile after pile is driven at the locations shown. End of drain pipe behind new sheet pile shall have geotextile placed over the end of the pipe, and secured in place using a stainless steel clamp. Geotextile shall be as specified in Section 02373.

3.5.2 Drain Pipe Extensions

New pipe shall connect to existing pipe using universal couplings and stainless steel clamps.

3.6 Measurement and Payment

3.6.1 Mobilization and Demobilization

All costs connected with the mobilization and demobilization of the Contractor's plant and equipment will be paid for at the lump sum price for this item as listed in the Bidding Schedule. Sixty percent (60%) of the lump sum price will be paid to the Contractor upon completion of his mobilization at the work site. The remaining forty percent (40%) will be included in the final payment for work under this contract.

3.6.1.1 Contractor Furnished Cost Data

In the event the Contracting Officer considers that the amount in this item (sixty percent) which represents mobilization, does not bear a reasonable relation to the cost of the work in this contract, the Contracting Officer may require the Contractor to furnish cost data to justify this portion of the bid price. Failure to justify such price to the satisfaction of the Contracting Officer will result in the payment of actual mobilization costs, as determined by the Contracting Officer, at the completion of mobilization. The payment of the remainder of this item will be included in the final payment under the contract. The determination of the Contracting Officer in these circumstances is not subject to appeal.

3.6.1.2 Mobilization and Demobilization Costs

All costs in connection with the mobilization and demobilization of the Contractor's plant and equipment as defined below shall be included in the contract lump sum price for Bid Item No. 1 "Mobilization and Demobilization".

a. Mobilization shall include all costs for operations accomplished prior to commencement of actual sheetpile installation; that is transfer of all plant and equipment to the work site, and all other incidentals in advance of sheetpile driving operations.

b. Demobilization shall include general preparation for transfer of the plant and equipment to the Contractor's home or standby base, cleanup, and the transfer of plant and equipment to the home or standby base.

3.6.2 Composite Sheet Pile

The work specified in this section will be measured for payment by the linear foot of sheet pile installed. Payment for this work will be made at the contract unit price for "Composite Sheet Pile", Bid Item No. 2. The contract unit price shall constitute full compensation to the Contractor for required work incidental to the sheetpile; installation of bent plate; epoxy coating; timber wales; drain extensions; and weep hole drains.

3.6.3 Steel Sheet Pile

The work specified in this section will be measured for payment by the linear foot of sheet pile installed. Payment for this work will be made at the contract unit price for "Steel Sheet Pile", Bid Item No. 3. The

contract unit price shall constitute full compensation to the Contractor for required work incidental to the sheetpile; installation of bent plate; timber wales; and weep hole drains.

-- End of Section --